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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

WYROZEBSKI LEE, KATARZYNA I

ART UNIT

PAPER NUMBER

1714

DATE MAILED: 11/12/2002

4

Please find below and/or attached an Office communication concerning this application or proceeding.

*Yachie Hanley.
New attorney
404-885-3561*

Office Action Summary	Application No. 10/072,759	Applicant(s) BARBEE ET AL.	
	Examiner Katarzyna W. Lee	Art Unit 1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment of 2/8/2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,12-14,17,18,25,37 and 50 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,12-14,17,18,25,37 and 50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1, 3-5, 12-14, 17, 18, 25, 37 and 50 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3-5, 12-14, 17, 18, 25, 37, 50 of U.S. Patent No. 6,384,121 B1 ('121). Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following explanation.

US Patent '121 in claim 1 recites a polymer-clay nanocomposite comprising (i) a melt-processible matrix polymer, (ii) a layered clay material and (iii) a matrix-polymer compatible oligomer or polymer having onium functional group bonded thereto, i.e., the it is functionalized.

According to claims 3-5 of '121, the polymers utilized as matrix polymers include polyamides, polyethylene terephthalate and EVOH. Among polyamides, listed are poly(*m*-xylylene adipamide), isophthalic acid modified poly(*m*-xylylene adipamide), nylon-6, nylon-6,6; their copolymers and mixtures.

According to claims 12-14, 17 and 18 of '121 the functionalized polymer and matrix polymer have the same monomer unite. The clay material is also pre-treated with organic cation. The organic cation is disclosed as onium compound.

According to claim 25 of '121, the polymer-clay nanocomposite comprises a melt-processible matrix polymer and incorporated therein a concentrate. The concentrate comprises layered clay material and matrix-compatible polymer oligomer or polymer functionalized with onium compound.

According to claim 37 of '121, the process for preparing polymer-clay nanocomposite includes steps of (i) forming a concentrate comprising layered clay material and matrix-compatible polymer oligomer or polymer functionalized with onium compound and (ii) melt-mixing the concentrate with melt-processible matrix polymer to form polymer-platelet nanocomposite.

Claims 18 and 50 of '121 recite an article made by composite of claim 1 and material obtained by the process respectively.

The difference between the present invention and U.S. Patent 6, 384, 121 is in the functionalized matrix-compatible oligomer or polymer. While '121 discloses that the matrix-compatible oligomer or polymer is modified with onium compound, the present invention is silent with the specific species.

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In view of the above difference, one of ordinary skill in the art, when utilizing invention of '121 would arrive at the present claims, because species anticipates genus. *In re Goodman*, 11 F.3d 1046 29 USPQ2d 2010 (Fed. Cir. 1985).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

4. Claim 17 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claim 17, recitation of term "type" in a limitation of "Wyoming-type sodium montmorillonite" and "Wyoming-type sodium bentonite" renders claim indefinite. Ex parte Copenhaver, POBA 1955, 109 USPQ 118-119.

Claim Objections

5. Claim 50 is objected to because of the following informalities: Claim 50 depends on cancelled claim 48. For more prompt prosecution of the case, the examiner will treat the claim as being dependent on independent process claim 37. Appropriate correction is required.

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Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

7. Claims 1, 18, 25, 37, 50 are rejected under 35 U.S.C. 102(e) as being anticipated by Lan (US 6,124,365).

The prior art of Lan discloses nanocomposite composition, wherein the clay is intercalated with oligomer or polymer then exfoliated in presence of matrix polymer.

According to the claim 1 of the prior art of Lan, the intercalant component is functionalized with a functional group, to achieve sorption and intercalation in-between the platelets of the clay component. The specification of Lan, in col. 5, further teaches that the functional group of intercalating compound renders intercalant compatible with matrix-polymer.

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In the process of the prior art of Lan as shown in the examples and col. 27-28 of the specification, as an important feature of the prior art, the intercalated clay component is manufactured in a concentrated form.

Exfoliation of the clay component is achieved *via* shear action utilizing various mixing equipment, for example, extruders and mixers.

The molding composition comprises matrix polymer and the intercalated clay mentioned above. The resulting composition is utilized to make sheets, extruded films and laminates.

In the light of the above disclosure, the prior art of Lan anticipates claims rejected above.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 3-5, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lan (US 6,124,365).

The discussion of the disclosure of the prior art of Lan from paragraph 7 of this office action is incorporated here by reference.

In addition to the above disclosure, the prior art of Lan renders the following claims obvious:

The preferred thermoplastic matrix polymers of the prior art of Lan as disclosed in the specification include polyesters and polyamides (col. 25-27). Among the named species of the polyamides and polyester included are nylon-6,6; nylon-6; poly(*m*-xylylene adipamide) and polyethylene terephthalate. Polyvinyl alcohol or EVOH is listed in col. 24, line 31.

The preferred clay component listed in col. 13 of Lan includes sodium montmorillonite, as well as other smectite type clay or phyllosilicates having cation exchange of 0.15-0.9. This

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would therefore encompass bentonite. Montmorillonite is specifically taught in the examples of the prior art of Lan.

Utilizing intercalates and exfoliated clays as taught in the prior art of Lan would result in a composition having improved gas permeability (col. 2), flame retardation, elasticity and high temperature resistance.

In the light of the above disclosure, it would have been obvious to one having ordinary skill in the art at the time of the present invention, to utilize intercalated clay of the prior art of Lan with matrix polymers such as polyamides and polyesters and thereby arrive at the present invention. The polymers of the present invention are taught by the prior art of Lan as matrix polymer to obtain composition having improved gas permeability.

12. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lan (US 6,124,365) as applied to claims 1, 3-5, 17, 18, 25, 37, 50 above, and further in view of Lan (US 6,232,388 B1) (Lan '388).

The discussion of the disclosure of the prior art of Lan'365 from paragraph 11 of this office action is incorporated here by reference.

The difference between the present invention and the disclosure of the prior art of Lan'365 is the recitation of pre-treating clay component with organic cation, which is an onium compound. The second difference is that the intercalating component and the matrix component have the same monomer units.

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With respect to the above difference, the prior art of Lan'388 discloses nanocomposite composition wherein the intercalating monomer or oligomer of MXD6 nylon, which is defined as poly(*m*-xylylene adipamide).

The clay component of the prior art of Lan'388 includes sodium bentonite (example 2) as well as montmorillonite (col. 12).

Clay component is pre-treated with onium compound in order to increase basal spacing between the platelets of the clay component and thereby afford more efficient intercalation of the intercalating monomer or oligomer or polymer.

Col. 6 of the prior art of Lan'388 also discloses that the monomer units of the intercalating compound and matrix polymer are the same.

Intercalating compounds such as organic onium salts or functionalized oligomers or polymers are both utilized for the same purpose, which is to increase the basal spacing of between the platelets of the clay component, which in turn would facilitate easier intercalation of the matrix component followed by high exfoliation content.

Although the prior art of Lan'365 states that the clay does not need to be pre-treated with onium compounds, it does not explicitly excludes such possibility. The onium compound and functionalized oligomer are both utilized as an intercalating agent, which would increase the basal spacing between the platelets of the clay components. It is well settled that it is *prima facie* obvious to combine two ingredients, each of which is targeted by the prior art to be useful for the same purpose. *In re Linder* 457 F,2d 506,509, 173 USPQ 356, 359 (CCPA 1972).

It would therefore have been obvious to one having ordinary skill in the art at the time of the instant invention to combine the teachings of Lan'365 and Lan'388 in such way that either

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the clay component is pre-treated in Lan'365 or the oligomer in Lan'388 is functionalized and thereby obtain the claimed invention. Combining the two prior art disclosures would work in additive or cumulative manner, since onium compound and functionalized monomer would intercalate in between the clay platelets thereby increasing the basal spacing.

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following prior art although relevant cannot be applied, since it does not qualify as a prior art against present claims: Lan (US 6,387,996 B1), Lan (US 6,225,394 B1), Lan (US 6,242,500 B1), Lan (US 6,262,162 B1), Qian (US 6,407,155 B1). Additional art includes Matabayas (US 6,084,019) and Trexel (US 6,162,857) do not have functionalized intercalant. Lan (US 6,057,396) is a parent case to already applied Lan'365.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katarzyna W. Lee whose telephone number is (703) 306-5875. The examiner can normally be reached on Mon-Thurs 6:30 AM-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (703) 306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



KIWL

November 7, 2002